Remarks

The present application has been reviewed in light of the Office Action mailed on May 3, 2007. There is no amendment made by this Response, and Claims 1-4, 7-15, and 36-40 are now pending in this application. Reconsideration of the rejections is earnestly requested in light of the following remarks.

Claims 36-40 are objected to because of the notations of the status of claims are incorrectly stated. Applicants submit that the foregoing list of claims now presents the correct notations of the status the claims.

Rejections Over Hattori and Asar

Claims 1-4, 7-15 and 38-40 were again rejected by the Examiner under 35 U.S.C. 103(a) as being unpatentable over Hattori (US Patent No. 6,212,751) in view of Asar (US Patent No. 6,434,264). Applicants respectfully traverse the rejection, and request the Examiner to reconsider in view of the following remarks.

The present invention as claimed is directed to an apparatus for positioning back-up pins on a support plate for supporting a circuit board thereon. Independent claim 1 and claims dependent there-from (namely, claims 1-4, 7-15 and 38-40) each requires, among the elements recited, (i) that a control unit have a display unit connected for displaying the surface images of the circuit board taken by the camera, in which the surface images include a first image representative of a portion of the surface of the circuit board and a second image representative of substantially the entire surface of the circuit board; and (ii) that the control unit include a user interface for allowing a user to allocate a plurality of support locations for supporting the circuit board with the back-up pins at locations not interfering with parts disposed on the

circuit board while viewing the first image and the second image of the circuit board displayed on the display unit; and (iii) that a transfer member be coupled with the control unit for transferring a plurality of back-up pins from the back-up pin stand to the allocated support locations on the back-up pin plate.

Hattori (US Patent No. 6,212,751) discloses a method and an apparatus for examining a position, and subsequently correcting the position, of at least one board-support pin (112/201) which was previously positioned on a board-support base (110/202) for supporting a printed-circuit board thereon. Hattori additionally further discloses a method and an apparatus for positioning at least one board-support pin on a board-support base.

However, Applicants respectfully submit that Hattori fails to disclose or teach, among other limitations, at least the above-identified elements (i) and (ii) of the invention as claimed.

First, as acknowledged by the examiner, Hattori does not provide any disclosure or teaching that its display device (186) can display the surface images of circuit board 24 in which the surface images include a first image representative of a portion of the surface of the circuit board 24 and a second image representative of substantially the entire surface of the circuit board 24. Accordingly, Hattori fails to disclose or teach the above-identified element **(i)** of the invention as claimed. Hattori teaches the use of a CCD camera 56, which takes only the image of the board-support pins 112 and reference board marks provided on the printed-circuit board so as to detect a position of the circuit board for subsequent judgment and correcting the position of the board-support pins. However, contrary to the present invention, the CCD camera 56 is not for taking any component images on the surface of the circuit board such as a first image representative of a portion of the surface of the circuit board and a second image representative of substantially the entire surface of the circuit board for the purposes of

allocating adequate support locations thereof so as not to interfere with parts on the surface of the circuit board. Hattori is entirely ignorant of this feature of the present invention as claimed.

Moreover, Hattori does not include any disclosure or suggestion that its control unit has a user interface which specifically allows a user to allocate (before positioning the pins) a plurality of support locations for supporting the circuit board with the back-up pins at locations not interfering with parts disposed on the circuit board while viewing the first image and the second image of the circuit board displayed on the display unit. Thus, Hattori further fails to disclose or teach the above-identified element **(ii)** of the invention as claimed.

The Examiner states that Hattori discloses the control unit (160) including "a user interface (170/172) for allowing a user to allocate a plurality of support locations (see Fig. 7 and Col. 10, lines 11-10) for supporting the circuit board (as shown in Fig. 1) with the back-up pins at locations not interfering with parts (32) disposed on the circuit board (24) while viewing the images of the circuit board displayed on the display unit (16, *see Fig. 13*)". Office Action at page 3.

Applicants respectfully traverse. Nowhere in the Hattori disclosure indicates that the allocation of plural support locations is to be performed through a user interface while viewing the images of the circuit board displayed on the display unit. In the above allegation that the allocation of the back-up pins would be made while viewing the images of the circuit board displayed on the display unit, the Examiner deems to rely on Fig. 13. However, as stated in the Brief Description of the Drawings section, Fig. 13 is a schematic view for explaining another method of examining a position of a board support pin after the pin was positioned in a previous step. The detailed description of this embodiment also clearly supports that this is a method related to examining or judging whether the actual position of each board-support pin positioned previously is

appropriate or not. See Col. 17, lines 27-34. Thus, this Hattori disclosure is not related to any allocation of plural support locations before positioning the back-up pins. Furthermore, nowhere in the Hattori disclosure indicates that the allocation is to be performed while viewing the first image and the second image of the circuit board displayed on the display unit for accurate allocation of the pins.

The Examiner further states that Hattori teaches the control unit (160) includes "a user interface (170/172) for inputting operating instructions (by operator, see Col. 16, lines 63-67), such as data for allocating back-up pins onto the back-up pin plate (see Col. 10, lines 9-19 and Col. 10, lines 40-53) at locations not interfering with parts (32) disposed on the circuit board (24, see Fig. 13)". Office Action at page 6, item (a).

Applicants respectfully traverse. As detailed above, nowhere in the Hattori disclosure indicates that the allocation of plural support locations is to be performed with the aid of a user interface while viewing the first image and the second image of the circuit board displayed on the display unit. As detailed also above, the description associated with Fig. 13 is not related to any allocation of plural support locations before positioning the back-up pins, is rather related to examining the position of a support pin after positioning the pin in order to correct the position if it is inappropriately positioned. Hattori discloses methods for positioning a back-up pin. However, all such positioning methods utilize: either a transparent template 150 (shown in Fig. 5) to manually teach the location to place the pin (see Col. 9, line 56 to Col. 10, line 6, also Col. 10, line 54 to Col. 11, line 14); or reference position data previously stored in the RAM 166 to indirectly guide the allocation (see Col. 15, lines 2-7). These positioning methods are substantially different from that of the present invention which utilizes a user interface to allocate plural pin locations while viewing the first image and the second image of the circuit board displayed on the display unit. None of the Hattori methods suggests

the allocation of the pin locations to be made while viewing the images of the circuit board displayed on the display unit.

In clear contrast to Hattori, the present invention requires the novel feature of allocating plural support locations of the back-up pins at locations not interfering with parts disposed on the circuit board while viewing at least the first image and the second, and of subsequent transferring a plurality of back-up pins from the back-up pin stand to the allocated support locations on the back-up pin plate, while utilizing the surface images taken by a camera, which includes a first image representative of a portion of the surface of the circuit board and a second image representative of substantially the entire surface of the circuit board, as respectively recited by the above elements (i), (ii) and (iii). Hattori is entirely ignorant of these novel features of the present invention.

As detailed above, Hattori does not disclose or teach, among others, any of the above identified elements **(i) and (ii)** of the invention as claimed in claims 1-4, 7-15, and 36-40. Thus, claims 1-4, 7-15, and 36-40 are patentable over Hattori.

Asar (US Patent No. 6,434,264), on the other hand, discloses a vision comparision inspection system for inspecting or identifying defects in a printed circuit assembly line. Asar is cited by the Examiner only to suggest if it would disclose a display unit that displays a first image representative of a portion of the surface of the circuit board and a second image representative of substantially the entire surface of the circuit board as recited in the above element (i).

Applicant respectfully submit that, as is Hattori discussed above, Asar also fails to disclose or teach, among other limitations, at least the above element **(ii)** of the invention as claimed. Asar is absolute silent as to, as required by the above element (ii) of the invention, if any device of the system is to be used to allocate plural support locations of the back-up pins at locations not interfering with parts disposed on the

circuit board while viewing at least the first image and the second. In fact, Asar is concerned to solve entirely different problems and totally ignorant of the above identified novel features of the present invention.

In summary, Hattori and Asar each fails to disclose or teach, among other limitations, at least the above-identified element **(ii)** of the invention as claimed. Accordingly, because Hattori and Asar, either alone or in combination with each other, fails to disclose each and every element of independent claim 1, claims 1-4, 7-15, and 36-40 are patentable over these references.

Moreover, as discussed above, Asar is concerned to solve entirely different problems associated with a vision inspection system for inspecting a printed circuit assembly, and not related to an apparatus for allocating and positioning back-up pins on a support plate for supporting a circuit board thereon. Applicants submit that Asar is a non-analogous art, and thus, it is improper to use Asar as a 103(a) reference for combining with other references in order to reject a claim under 35 U.S.C. 103(a).

Furthermore, because Asar concerns to solve entirely different problems, one of ordinary skill in the art would not find any motivation to examine the Asar disclosure in order to modify or combine with the teachings of Hattori, and thus, to arrive at the invention as claimed.

The Examiner states that Asar teaches the display unit (240) that displays a first image representative of a portion of the surface of the circuit board (52) and a second image representative of substantially the entire surface of the circuit board (52) "for allowing user/operator rapidly inspect the surface of the circuit board." The Examiner subsequently alleged that, therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the invention of Hattori by

utilizing the display unit and display technique as taught by Asar "for allowing user rapidly inspect the surface of the circuit board." Office Action at pages 3-4.

Applicants respectfully traverse at least because the Examiner fails to specify what would be the motivation to modify Hattori to include the missing elements of claim 1 (such as the above element (i)) to reach at the claimed invention. Moreover, Examiner further fails to specify any desirability of such motivation to combine or modify the references. Applicants submit that there is no suggestion or teaching in Hattori and Asar that modification would be desirable. Asar teaches the use of multiple screens showing different views of a circuit board. However, this is only for inspecting defects on the circuit board, but not related at all to allocating back-up pins for subsequent positioning of the pins on a support plate. Because Asar concerns to solve entirely different problems, one of ordinary skill in the art would not find any motivation to examine the Asar disclosure in order to modify or combine with the teachings of Hattori, and thus, to reach at the invention as claimed.

In this regard, it is well established that the mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination or modification. *In re Mill, 916 F.2d 680, 16 USPQ2d 1430 (Fed. Cir. 1990).* See also *MPEP 2143.01.* As discussed above, the prior does not suggest the desirability of the combination or modification. To the contrary, at least because Asar concerns to solve entirely different problems, one of ordinary skill in the art would not find any motivation to examine the Asar disclosure in order to modify or combine with the teachings of Hattori.

It is also well settled that a statement that modifications of the prior art to meet the claimed invention would have been "well within the ordinary skill of the art at the time the claimed invention was made" because the references relied upon teach that all aspects of the claimed invention were individually known in the art is not sufficient to

establish a *prima facie* case of obviousness without some objective reason to combine the teachings of the references. *Ex parte Levengood*, 28 USPQ2d 1300 (Bd. Pat. App. & Inter. 1993). See also *In re Kotzab,* 217 F.3d 1365, 1371, 55 USPQ2d 1313, 1318 (Fed. Cir. 2000). See also *MPEP 2143.01.* As discussed above, the Examiner fails to specify objective reasons for the combination or modification.

It is also well settled that, to establish prima facie obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art. *In re Royka, 490 F.2d 981, 180 USQ 580 (CCPA 1974).* All words in a claim must be considered in judging the patentability of the claim against the prior art. *In re Wilson, 424 F.2d 1382, 1385, 165 USPQ 494, 496 (CCPA 1970). Also, MPEP 2143.03.* Applicants submit Hattori and Asar each fails, among other limitations, the above identified limitations that are included in the body of the claim.

Lastly, according to page 6-7, Item (d), of Office Action, it seems that the Examiner alleges that if the prior art structure (which has the same structure as that of the claimed element at issue) is capable of performing the intended use and performs the same function (as that of the claimed element at issue), then it meets the claim in the application. However, as detailed above, Hattori does not suggest that its interface is to be used for allocating the pin support locations while viewing the first image and the second image of the circuit board displayed on the display unit. Therefore, the Hattori structure (i.e., its user interface) is neither capable of performing the same intended use nor performs the same function as the recited user interface of the present invention.

Conclusion

In summary, as detailed above, claims 1-4, 7-15, and 36-40 are patentable over the references of record at least because Hattori and Asar each fails to disclose or teach,

among other limitations, the above-identified element **(ii)** of the invention that the control unit include a user interface for allowing a user to allocate a plurality of support locations for supporting the circuit board with the back-up pins at locations not interfering with parts disposed on the circuit board while viewing the first image and the second image of the circuit board displayed on the display unit. Moreover, as Asar is concerned to solve entirely different problems, and not related to any allocation of the support pin locations, there would be no motivation recognizable by one of ordinary skill in the art to combine or modify the references to include any of the missing elements, such as the above elements (i) and (ii), in order to reach at the invention as claimed.

For the foregoing reasons, Applicants sincerely submit that all pending claims, namely claims 1-4, 7-15, and 36-40, are patentable over the references of record and in condition for allowance. Favorable reconsideration of the Office Action is earnestly solicited.

Request for Interview

Applicants respectfully request a telephonic interview prior to a further Official Action, if one is to be issued, and would greatly appreciate the Examiner contacting the undersigned attorney to arrange such an interview.

Respectfully submitted,

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